MPEP §2131.03 states the following:

> "If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, dependent on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with 'sufficient specificity' to constitute anticipation of the claims."

In the present case, the Goodboy reference discloses a broad range of 0.1 to 2.5 wt. % sodium oxide and a preferred range of 0.50 to 2.5 wt. % (column 3, lines 57-60 of Goodboy). Applicants, on the other hand, claim a range of 1200 to 2500 ppm (0.12 to 0.25%), i.e. a narrow range within Goodboy's broad range, and Applicants have submitted a showing of unexpected improvement in conversion of CS_2 over the claimed narrow range (see previously submitted Nedez Declaration). Accordingly, because of the claimed narrow range and the evidence of unexpected results, the claimed narrow range is not disclosed with "sufficient specificity" in Goodboy to constitute anticipation.

Overlapping Ranges Only Presents §103 Issue

There is well established legal precedent that overlapping ranges only presents a prima facie case of obviousness under 35 USC §103, not anticipation under 35 USC §102. As such, to the extent the discussion in MPEP §2131.03 of Ex parte Lee, 31 USPQ2d 1105 (BPAI 1993) suggests that overlapping ranges per se establishes anticipation, any such per se rule would be in conflict with a long line of CCPA and CAFC cases.

Obviousness of ranges is discussed at MPEP §2144.05 wherein CCPA cases such as In re Wertheim, 191 USPQ 90 (CCPA 1976), and CAFC cases such as In re Woodruff, 16 USPQ2d 1934 (Fed. Cir. 1990) and In re Geisler, 43 USPQ2d 1362 (Fed. Cir. 1997) are

discussed. In Woodruff, a prior art teaching of "about 1-5%" CO was held to overlap claims limited to "more than 5%", and in Geisler, a claimed thickness of" 50 to 100 Angstroms" was held prima facie obvious over a reference teaching of not less than 100 Angstroms. The courts in Woodruff and Geisler acknowledged, however, that a prima facie case of obviousness based on overlapping ranges can be rebutted by showing criticality of the claimed range (see discussion at MPEP §2144.05 III. Rebuttal of Prima Facie Case of Obviousness). In the present case, because the Nedez Declaration provides such a showing, the rejection over the Goodboy reference should be withdrawn.

§102 Rejection

Claims 1-3, 7 and 11-21 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 4,364,858 ("Goodboy"). The reasons for the rejection are set forth on page 3 of the Official Action.

Claim 1 sets forth an activated alumina catalyst comprising a cocatalytically effective amount of sodium values wherein the effective amount, expressed by weight of Na_2O, ranges from 1,200 ppm to 2,500 ppm. Goodboy, on the other hand, relates to an activated catalyst having an overlapping sodium oxide content for purposes of providing resistance to sulfate poisoning (column 3, lines 10-33 of Goodboy). Goodboy states that a high sodium oxide content is beneficial for achieving low CO_2 chemisorption and the preferred amount of Na_2O is 5000 ppm and above (see column 3, line 54 through column 4, line 22 of Goodboy). Goodboy does not disclose or suggest an activated alumina catalyst having a cocatalytically effective amount of sodium values for conversion of CS_2 wherein the effective amount is expressed by weight of Na_2O ranging from 1200 to 2500 ppm. As

such, it is submitted that Goodboy fails to disclose or suggest the combination of features recited in Claim 1.

In In re Baird, 29 USPQ 2d 1550 (Fed. Cir. 1994), the court stated that "[t]he fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious." Also, evidence of unexpectedly good results can overcome a rejection based on optimization of a "result effective variable" provided the unexpected results are established by factual evidence. In re DeBlauwe, 222 USPQ 191, at 196 (Fed. Cir. 1994). With respect to optimization, in In re Antonie, 195 USPQ 6, 8 (CCPA 1977), the court stated that:

> The PTO and the minority appear to argue that it will always be obvious for one of ordinary skill in the art to try varying every parameter of a system in order to optimize the effectiveness of the system even if there is no evidence in the record that the prior art recognized that particular parameter effected the result. As we have said many times, obvious to try is not the standard of 35 U.S.C. §103. (Emphasis in original.) Antonie, at 8.

The court in Antonie also stated that while the discovery of an optimum of a variable in a known process is normally obvious, there are two exceptions to the rule. The first exception is when the results of optimizing a variable, which was known to be result effective, were unexpectedly good. The second exception is in the case where the parameter optimized was not recognized to be a result-effective variable. In the present case, both exceptions apply since Goodboy provides no recognition that low Na_2O contents would be effective in providing improved CS_2 conversion rates.

Goodboy states that increased sulfur conversion can be obtained using an activated alumina catalyst in which sodium oxide concentration, LOI (hydroxyl content determined by heating from 400° to 1100°C) and surface area are controlled (column 3, lines 17-21 and 31-32 of Goodboy). Goodboy discloses a broad range of 0.1 to 2.5 wt % sodium oxide but prefers 0.50 to 2.5 wt % on a 1000°C calcined basis (column 3, lines 57-60 of Goodboy). Goodboy teaches away from low sodium oxide contents at column 4, lines 18-35 wherein it is stated "low sodium oxide content was believed to be desirable...[but contrary] to this expectation, significant amounts of sodium oxide are not only tolerable to a Claus catalyst, but, in fact, are beneficial . . . ." Goodboy thus leads away from the claimed invention.

Goodboy's Examples 1-9 show a conversion rate of "S" of 79.1 to 82.9% for Na_2O contents of 0.44, 1.36, 0.43, 0.41, 0.09, 2.10, 0.10 and 0.33 wt % (1000°C Basis) according to Table I of Goodboy. Such results would be plotted as an essentially flat curve, the conversion rate of 0.09 and 0.10 wt % Na_2O being essentially the same as that of the 0.33 wt % and above Na_2O contents. Further, it is noted that Goodboy measured SO_2 chemisorption rather than conversion of CS_2.

It is well established that the unexpected discovery of improved results for a limited range within a broader range merits patent protection. See Baird, supra. In view of Goodboy's preference for Na_2O contents in amounts of 0.5% and above and Goodboy's data showing essentially the same conversion rate for Na_2O contents of 0.09 to 2.10%, the skilled artisan would not have expected low Na_2O contents to produce the dramatic improvement in CS_2 conversion discovered by Applicants. It is submitted that Appellants'

showing of unexpected improvement in CS_2 conversion rates for the claimed range of 0.12 to 0.25% Na_2O rebuts any prima facie case of obviousness based on Goodboy.

The Nedez Declaration includes Attachment I wherein CS_2 conversion is plotted with respect to various Na_2O contents in a gas-catalyst prepared according to the process set forth in paragraph 2 of the Nedez Declaration. Attachment I shows the interpolated data corresponding to CS_2 conversion rate for the closest Na_2O examples of Goodboy compared to the claimed 1,200 to 2,500 ppm Na_2O range (see paragraph 7 of the Nedez Declaration). Attachment I shows that the claimed 1,200 to 2,500 ppm Na_2O content provides new and unexpected results with respect to CS_2 conversion compared to Na_2O contents above and below the claimed range.

In the preceding final Official Action, it was stated that Goodboy discloses "a Claus catalyst in the form of activated alumina containing sodium oxide in an amount greater than 0.1 wt% of the catalyst, preferably between 0.1 and 2.5 wt%" (final Official Action at page 3). In addition, the final Official Action stated that "the catalyst possesses . . . higher catalytic activity with respect to compounds such as . . . CS_2 . . ." (Official Action at page 5). Further, while it was acknowledged in the November 2, 1998 Official Action that "a catalyst is unpredictable" (November 2, 1998 Official Action at page 8), the final Official Action argued that a skilled artisan "would reasonably expect that within the . . . sodium oxide concentration taught by Goodboy an optimum concentration for catalytic activity with respect to CS_2, H_2S, SO_2 and COS would differ for each" (final Official Action at pages 7-8). However, in view of Goodboy's Examples 1-9 wherein SO_2 conversion is essentially the same (79.1 to 82.9%) for all Na_2O contents in the range of 0.09 to 2.10 wt % Na_2O, it

is submitted that one of ordinary skill in the art would not have expected to find an "optimum" concentration of Na_2O based on the teachings of Goodboy. Besides, whether or not the effect of Na_2O is a recognized result effective variable, unexpectedly improved results for a recognized result effect variable can overcome a prima facie case of obviousness. See Antonie, supra. Accordingly, withdrawal of the rejection of Claim 1 is respectfully requested.

Claim 11 recites a catalyst comprising at least 0.5% by weight of an activated alumina catalyst comprising a cocatalytically effective amount of sodium values, said effective amount, expressed by weight of Na_2O, ranging from 1,200 ppm to 2,700 ppm. The Official Action does not address Claim 11. As such, the combination of features recited in Claim 11 further patentably distinguishes the claimed invention over the prior art.

Claim 12 recites a catalyst comprising from 60% to 99% by weight of activated alumina catalyst comprising a cocatalytically effective amount of sodium values, said effective amount, expressed by weight of Na_2O, ranging from 1,200 ppm to 2,700 ppm. The Official Action does not address Claim 12. As such, the combination of features recited in Claim 12 further patentably distinguishes the claimed invention over the prior art.

Claim 13 recites a process wherein a catalyzed Claus reaction is used for the production of elemental sulfur, the improvement comprising using as the catalyst therefor, an activated alumina catalyst comprising a cocatalytically effective amount of sodium values, said effective amount, expressed by weight of Na_2O, ranging from 1,200 ppm to 2,700 ppm. The Official Action does not address Claim 13. As such, the combination of

features recited in Claim 13 further patentably distinguishes the claimed invention over the prior art.

Claim 14 recites a process for the catalyzed hydrolysis of an organosulfur compound wherein the improvement comprises using as the catalyst therefor, an activated alumina catalyst comprising a cocatalytically effective amount of sodium values, said effective amount, expressed by weight of Na_2O, ranging from 1,200 ppm to 2,700 ppm. The Official Action does not address Claim 14. As such, the combination of features recited in Claim 14 further patentably distinguishes the claimed invention over the prior art.

Claim 15 recites a process for catalytically removing objectionable sulfur compounds from gaseous effluents comprised thereof wherein the improvement comprises using as the catalyst therefor, an activated alumina catalyst comprising a cocatalytically effective amount of sodium values, said effective amount, expressed by weight of Na_2O, ranging from 1,200 ppm to 2,700 ppm. The Official Action does not address Claim 15. As such, the combination of features recited in Claim 15 further patentably distinguishes the claimed invention over the prior art.

Claim 16 recites that the activated alumina catalyst as defined by Claim 1 has a specific surface of 350 to 370 m^2/g. Although a prior Official Action cited column 3, lines 65-68 of Goodboy for a suggestion to provide a specific surface of at least 300 m^2/g, there is no teaching or suggestion in Goodboy to provide the activated alumina with a specific surface in the claimed range of 350 to 370 m^2/g. As established by example 2 of Appellants' specification, when the specific surface is 360 m^2/g (± 10 m^2/g), it is possible

to achieve the unexpected improvement in conversion of CS_2 set forth in the Nedez Declaration.

Claim 17 recites that the activated alumina catalyst as defined by Claim 11 has a specific surface of 350 to 370 m^2/g. Although a prior Official Action cited column 3, lines 65-68 of Goodboy for a suggestion to provide a specific surface of at least 300 m^2/g, there is no teaching or suggestion in Goodboy to provide the activated alumina with a specific surface in the claimed range of 350 to 370 m^2/g. As established by example 2 of Appellants' specification, when the specific surface is 360 m^2/g (± 10 m^2/g), it is possible to achieve the unexpected improvement in conversion of CS_2 set forth in the Nedez Declaration.

First §103 Rejection

Claims 4-6, 8, 9, 22 and 23 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Goodboy in view of U.S. Patent No. 5,244,648 ("Dupin"). The reasons for the rejection are set forth on pages 5-6 of the Official Action.

The Official Action cites Dupin to cure various deficiencies of Goodboy with respect to features recited in claims other than Claim 1. Dupin is discussed below in connection with various dependent and independent claims.

Claim 4 recites that the activated alumina catalyst as defined by Claim 1 further comprises silica and/or at least one oxide of titanium, zirconium, cerium, tin, a rare earth, molybdenum, cobalt, nickel or iron. In the final Official Action, Goodboy was cited for a disclosure of activated alumina used as a catalyst base (support) to which "compounds" of Mo, Co, Ni, Fe, U, Ca, Zn, Ti and others are added (see final Official Action at page 3

citing column 6, lines 62-68 of Goodboy). Because Goodboy does not mention silica or "oxides" of Ti, Zr, Ce, Sn, a rare earth, Mo, Co, Ni or Fe, Claim 4 further patentably distinguishes the claimed invention over Goodboy. To the extent Dupin is relied on in the present Official Action for a suggestion to add silica to the alumina of Goodboy, Dupin states that the alumina disclosed therein "can be heat stabilized with rare earths, silica or alkaline earth metals . . . ." (column 8, lines 37-42 of Dupin). Such teachings of Dupin are not seen to provide a suggestion to modify Goodboy in a manner which would produce the combination of features recited in Claim 4.

Claim 5 recites that the activated alumina catalyst as defined by Claim 1 further comprises a clay, a silicate, an alkaline earth metal or ammonium sulfate, ceramic fibers, asbestos fibers, or combination thereof. To the extent Dupin is relied on in the present Official Action for a suggestion to add silica to the alumina of Goodboy, Dupin states that the alumina disclosed therein "can be heat stabilized with rare earths, silica or alkaline earth metals . . . ." (column 8, lines 37-42 of Dupin). Such teachings of Dupin are not seen to provide a suggestion to modify Goodboy in a manner which would produce the combination of features recited in Claim 5.

Claim 6 recites that the activated alumina catalyst as defined by Claim 1 further comprises cellulose, carboxymethyl cellulose, carboxyethyl cellulose, tallol, a xanthan gum, a surface-active agent, a flocculating agent, a polyacrylamide, carbon black, a starch, stearic acid, polyacrylic alcohol, polyvinyl alcohol, a biopolymer, glucose, a polyethylene glycol, or combination thereof. In the Official Action, Dupin is cited for a suggestion to add cellulose to the Goodboy activated alumina for purposes of forming pores (see page 5

of the Official Action). Dupin, however, suggests lowering the Na_2O content to less than 1000 ppm (column 3, lines 46-49) . As such, the combination of features recited in Claim 6 further patentably distinguishes the claimed invention over the prior art.

Claim 7 recites that the activated alumina catalyst as defined by Claim 1 comprises extrudates, tablets, or beads thereof. Goodboy discloses that the catalysts according to the Goodboy invention are used in fixed or mobile beds with the dimensions of the constituent grains being adapted to the particular situation (see column 7, lines 1-4 of Goodboy). In the Official Action, it is stated that Goodboy discloses "agglomerated particles (i.e., beads) . . . ." (Official Action at page 3). Goodboy, however, refers to "grains" (column 7, lines 1-4 of Goodboy). According to Dupin, beads are formed in an operation such as pelletizing, extrusion or shaping (column 3, lines 50-54 of Duplin). Dupin, however, suggests lowering the Na_2O content to less than 1000 ppm (column 3, lines 46-49). As such, the combination of features recited in Claim 7 further patentably distinguishes the claimed invention over the prior art.

Claim 8 recites that the activated alumina catalyst as defined by Claim 7 comprises a plurality of beads having a diameter size ranging from 1.5 mm to 10 mm. The Official Action states that the claimed bead sizes are obvious but does not cite any prior art to support the rejection. As such, the combination of features recited in Claim 8 further patentably distinguishes the claimed invention over the prior art.

Claim 9 recites that the beads as defined by Claim 8 have a diameter size ranging from 3 mm to 7 mm. The Official Action states that the claimed bead sizes are obvious but

does not cite any prior art to support the rejection. As such, the combination of features recited in Claim 9 further patentably distinguishes the claimed invention over the prior art.

Claim 18 recites that the activated alumina catalyst as defined by Claim 12 has a specific surface of 350 to 370 m^2/g. Although a prior Official Action cited column 3, lines 65-68 of Goodboy for a suggestion to provide a specific surface of at least 300 m^2/g, there is no teaching or suggestion in Goodboy to provide the activated alumina with a specific surface in the claimed range of 350 to 370 m^2/g. As established by example 2 of Appellants' specification, when the specific surface is 360 m^2/g (± 10 m^2/g), it is possible to achieve the unexpected improvement in conversion of CS_2 set forth in the Nedez Declaration.

Claim 19 recites that the activated alumina catalyst as defined by Claim 13 has a specific surface of 350 to 370 m^2/g. Although a prior Official Action cited column 3, lines 65-68 of Goodboy for a suggestion to provide a specific surface of at least 300 m^2/g, there is no teaching or suggestion in Goodboy to provide the activated alumina with a specific surface in the claimed range of 350 to 370 m^2/g. As established by example 2 of Appellants' specification, when the specific surface is 360 m^2/g (± 10 m^2/g), it is possible to achieve the unexpected improvement in conversion of CS_2 set forth in the Nedez Declaration.

Claim 20 recites that the activated alumina catalyst as defined by Claim 14 has a specific surface of 350 to 370 m^2/g. Although a prior Official Action cited column 3, lines 65-68 of Goodboy for a suggestion to provide a specific surface of at least 300 m^2/g, there is no teaching or suggestion in Goodboy to provide the activated alumina with a specific

surface in the claimed range of 350 to 370 m^2/g. As established by example 2 of Appellants' specification, when the specific surface is 360 m^2/g (± 10 m^2/g), it is possible to achieve the unexpected improvement in conversion of CS_2 set forth in the Nedez Declaration.

Claim 21 recites that the activated alumina catalyst as defined by Claim 15 has a specific surface of 350 to 370 m^2/g. Although a prior Official Action cited column 3, lines 65-68 of Goodboy for a suggestion to provide a specific surface of at least 300 m^2/g, there is no teaching or suggestion in Goodboy to provide the activated alumina with a specific surface in the claimed range of 350 to 370 m^2/g. As established by example 2 of Appellants' specification, when the specific surface is 360 m^2/g (± 10 m^2/g), it is possible to achieve the unexpected improvement in conversion of CS_2 set forth in the Nedez Declaration.

Claim 22 sets forth that the activated alumina catalyst as defined by Claim 1 comprises beads having a diameter of 3.1 to 6.3 mm and specific surface area of 350 to 370 m^2/g. Although a prior Official Action cited column 3, lines 65-68 of Goodboy for a suggestion to provide a specific surface of at least 300 m^2/g, there is no teaching or suggestion in Goodboy to provide the activated alumina with a specific surface in the claimed range of 350 to 370 m^2/g. Further, that Official Action conceded that Goodboy fails to teach or suggest providing the Goodboy activated alumina in the form of beads with the claimed size (see final Official Action at page 4, lines 1-3). As established by example 2 of Appellants' specification, when the specific surface is 360 m^2/g (± 10 m^2/g) and the bead

particle size is 3.1 to 6.3 mm, it is possible to achieve the unexpected improvement in conversion of CS_2 set forth in the Nedez Declaration.

Claim 23 sets forth that the activated alumina catalyst as defined by Claim 1 comprises beads having (a) pore volume of alumina of pores of diameter greater than 0.1μm of 18.5 ml/100g and (b) pore volume of pores of alumina of diameter greater than 1μm of 15.5 ml/100g. The final Official Action conceded that Goodboy fails to teach or suggest providing the Goodboy activated alumina in the form of beads with the claimed pore volumes (see final Official Action at page 4, lines 1-3). As established by example 2 of Appellants' specification, when the pore volume of pores of diameter greater than 0.1 μm is 18.5 ml/100 g of alumina and the pore volume of pores of diameter greater than 1 μm is 15.5 ml/100 g of alumina, it is possible to achieve the unexpected improvement in conversion of CS_2 set forth in the Nedez Declaration.

Second §103 Rejection

Claim 10 was rejected under 35 U.S.C. §103 as allegedly being unpatentable over Goodboy in view of U.S. Patent No. 5,242,673 ("Stephanopoulos"). The reasons for the rejection are set forth on pages 6-7 of the Official Action.

Claim 10 recites that the activated alumina catalyst as defined by Claim 1 is deposited onto a support substrate therefor. Stephanopoulos is cited for a suggestion to deposit sulfur recovery catalysts containing aluminum oxide on supports (Official Action at page 6). Goodboy, on the other hand, states that the activated alumina is ground to a particle size of 10μm or less to achieve a particularly advantageous Claus catalyst (column 5, lines 63-68 of Goodboy). Goodboy thus teaches away from depositing the activated

alumina onto a support substrate. As such, the combination of features recited in Claim 10 further patentably distinguishes the claimed invention over the prior art.

Unexpected Results

In the final Official Action, it was stated that "[i]t is well settled that a patent cannot be granted for an applicant's discovery of a result, even though it may be unexpectedly good, which would flow logically from the teaching of the prior art" citing In re Rau, 117 USPQ 215 (CCPA 1958). The Rau decision does not appear in §716 "Affidavits or Declarations Traversing Rejections, 37 CFR 1.132" of the Manual of Patent Examining Procedure ("MPEP) or in Appendix II of the MPEP. In the present case, Appellants have discovered that unexpectedly good conversion of CS_2 can be obtained by using an activated alumina catalyst comprising a cocatalytically effective amount of sodium values expressed by weight of Na_2O ranging from 1200 ppm to 2500 ppm (Claim 1) or 1200 ppm to 2700 ppm (Claims 11-15). To the extent that Goodboy discloses an overlapping Na_2O content, MPEP §716.02(d) "Unexpected Results Commensurate in Scope With Claimed Invention - Demonstrating Criticality of a Claimed Range" states:

> "To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. In re Hill, 284 F.2d 955, 128 USPQ 197 (CCPA)."

The Rau decision does not discuss the showing necessary to demonstrate criticality of a claimed range, and therefore Rau is not applicable to the present case. As set forth in MPEP § 716.02(d), "the showing of unexpected results must be reviewed to see if the results occur over the entire claimed range." In the present case, an examination of

Exhibit I of the Nedez Declaration shows that the improvement of CS_2 conversion occurs over the entire claimed range.

As set forth in MPEP § 716.02(e) "Comparison With Closest Prior Art," it is necessary to compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. In the present case, an examination of Exhibit I of the Nedez Declaration shows that the improvement of CS_2 conversion occurs over the entire claimed range and that the closest examples of Goodboy (900 ppm, 1000 ppm and 3300 ppm) do not achieve the unexpected improvement in CS_2 conversion achieved by Na_2O contents within the claimed range.

As set forth in MPEP § 716.02 "Allegations Of Unexpected Results," it is necessary to determine whether the properties differ to such an extent that the difference is really unexpected. This portion of the MPEP cites In re Waymouth, 499 F.2d 1273, 182 USPQ 290, 293 (CCPA 1974) for the following test:

> ". . . unexpected results for a claimed range as compared with the range disclosed in the prior art had been shown by a demonstration of a 'marked improvement, over the results achieved under other ratios, as to be classified as a difference in kind, rather than one of degree.'"

A review of Exhibit I of the Nedez Declaration reveals that the CS_2 conversion drops off dramatically at values above 2700 ppm Na_2O and below 1200 Na_2O. Such results are truly unexpected in view of Goodboy's preference for Na_2O contents above 0.50 % (5000 ppm) in order to reduce SO_2 chemisorption upon the catalyst (see column 3, line 54 through column 4, line 6 of Goodboy). Goodboy discloses that "[i]n order to achieve low SO_2 chemisorption . . . high sodium oxide content [is] beneficial" (see column 4, lines 18-

22 of Goodboy). Accordingly, while Goodboy discloses an overlapping range of Na_2O, Goodboy teaches away from the claimed range which Appellants have shown produces unexpected improvement in CS_2 conversion.

The final Official Action took the position that "[a] skilled artisan would recognize that the amount of sodium oxide required for optimum results would differ for each of said recited compounds" and that depending on the process for which the catalyst is to be employed, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have determined the optimum concentration of sodium oxide because sodium oxide is a recognized result-effective parameter' (final Official Action at pages 6-7). However, such an approach is contrary to the decision in Antonie. That is, the court in Antonie stated that while the discovery of an optimum of a variable in a known process is normally obvious, there are two exceptions to the rule. The first exception is when the results of optimizing a variable, which was known to be result effective, were unexpectedly good. The second exception is in the case where the parameter optimized was not recognized to be a result-effective variable. In the present case, both exceptions apply since (1) Goodboy provides no recognition that low Na_2O contents would be effective in providing improved CS_2 conversion rates and (2) the Nedez Declaration establishes that even if the Na_2O content of Goodboy is considered to be a result effective variable, the claimed Na_2O content achieves CS_2 conversion rates which are "unexpectedly good" compared to the closest examples in Goodboy.

Conclusion

It is submitted that the differences between the claimed subject matter and the prior art are such that the claimed subject matter, as a whole, would not have been obvious at the time the invention was made to a person having ordinary skill in the art.

In view of the foregoing, it is submitted that the present application is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

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